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June 12, 2015

BY EFILE

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: Ex Parte Communication, ET Docket 14-165; GN Docket No. 12-268

Dear Ms. Dortch:

This letter is submitted, pursuant to Section 1.1206(b)(1) of the FCC's rules, to notify you that representatives of the Wireless Medical Telemetry Service ("WMTS") Coalition met June 10, 2015 with the following staff members of the FCC: Julius Knapp, Ira Keltz, Geraldine Matise, Hugh Van Tuyl, and Aspasia Paroutsas of the Office of Engineering and Technology ("OET"). The WMTS Coalition was represented by Dale Woodin, Executive Director of the American Society for Healthcare Engineering of the American Hospital Association ("ASHE"); Mark Gibson of Comsearch, the technical consultant to ASHE; Ari Fitzgerald and Tom Peters of Hogan Lovells US LLP representing GE Healthcare; Matt Pekarske of GE Healthcare (by telephone); and the undersigned counsel to ASHE and the WMTS Coalition.

On May 22, 2015, Google, Inc. submitted an *ex parte* letter discussing further analyses that, in its view, support, among other matters, the Commission's proposal for separation distances between unlicensed users and existing Channel 37 operations. Specifically, in its May 22 *ex parte* (hereafter the "Google Proposal") Google, relying primarily on GE Healthcare's assumptions regarding WMTS operations, claimed that low-power unlicensed devices can operate well within 200 meters of any WMTS facility's perimeter, without causing harmful interference to WMTS equipment. We disagree with Google that this is an appropriate default protection zone.

The WMTS Coalition previously reached out to Google to discuss the Coalition's concerns with many of the proposals outlined by the FCC and other parties commenting on it,

including the proposals of Google, Broadcom and Microsoft, the principal proponents for expanded unlicensed use of Channel 37. Our hope has been that adversarial views could be resolved in a mutually satisfactory fashion. During those discussions, Google previewed many of the concepts described in the Google Proposal, particularly its thought that a simpler approach to calculating the protection distances would avoid debate over the methodology used, and focus instead on the specific attributes of each hospital that was being protected. The Coalition members in attendance were open to this approach and looked forward to further discussions of the details. The Google Proposal purports to provide those details. The Coalition continues to hope that, notwithstanding substantial differences in the assumptions used to develop protection distances, a mutually satisfactory resolution can be achieved through discussion and dialogue.

While we appreciate Google's effort to develop a simpler calculation for a "default" protection distance at various power levels, the Google Proposal fails to provide adequate protection from interference for a significant percentage of WMTS licensed facilities. Contrary to Google's suggestion (at Note 45) that "we make an extremely conservative estimate here on account of the critical nature of WMTS uses," Google has chosen to use the characteristics of what it deems to be the "real world" of hospital installations, which, in reality, fails to describe a significant percentage of hospitals or WMTS system installations. This is the wrong approach for assuring that WMTS licensees will not suffer harmful interference.

WMTS systems are the backbone of life-saving healthcare monitoring systems for critically ill patients and cannot tolerate harmful interference. As such, the Coalition has consistently urged that the Commission's guiding principles in determining the final rules for operation of TWVS devices in Channel 37 must be prioritized on protecting licensed WMTS systems from interference and terminating interference promptly when it occurs. These goals must be applied to protect all WMTS licensees, and not merely those meeting what Google or others claim (without supporting evidence) to be the "real world" hospital environment. And these principles must prevail even if appropriately calculated protection distances, power levels and restrictions on portability and operations result in less than optimal market conditions for the developers of TVWS devices using Channel 37.

Interestingly, Google has not provided even a scintilla of evidence of how it has determined what constitutes a "real world" or "typical" hospital construction or WMTS system operating environment. Google does criticize the tests conducted by GE Healthcare and Comsearch at an actual hospital in the Washington, D.C., area, suggesting that it does "not necessarily reflect a real-world environment." But Google provides no basis for arguing that an ***actual*** hospital located within a short drive from FCC headquarters is not a "real-world" environment.[1] Simply stated, Google's assumptions (discussed below) lack credibility. Most

[1] Google reiterates what it calls the "most important" claim, that GE Healthcare skewed the test "by choosing a test site a substantial distance from any adjacent-channel broadcaster," with the result that "GE Healthcare was likely able to detect "interference" from signals that would never have been noticeable at WMTS sites operating on channel 37 in noisier environments." Google Proposal at 8. This "most

significantly, the only tests of a "real-world" hospital currently in the record demonstrated that interference will occur when transmissions at the power levels and distances proposed by the FCC are received by a WMTS system in a hospital with characteristics similar to Inova.[2]

On the other hand, the record in this proceeding now contains approximately 200 individualized letters from WMTS licensed health care facilities that describe the environment in which WMTS systems are deployed at their respective hospital. Those letters individually and collectively demonstrate that there is no "typical" or "real world" hospital environment that can be assumed in developing rules designed to assure that interference will not occur from TVWS devices operating in Channel 37 – and surely not one with the characteristics used by Google in its analysis. To the contrary, those letters demonstrate that many hospitals have installed WMTS receivers in patient rooms on high floors with wide windows – environments in which the WMTS system will likely have some line-of-sight path to any TVWS device operating in the vicinity, with very little, if any path loss to a potentially interfering signal due to environmental circumstances or building construction.

Throughout the Google Proposal, Google improperly (and without any actual evidence) justifies its assumptions as conservative because "there are many markets" in which the characteristics of the environment would be better than the hospital tested. Of course, the opposite conclusion is also true: there are many markets in which the characteristics of the environment *will be worse*. To supplement the record already developed in this proceeding, the Coalition is attaching hereto as Exhibit 1 pictures and pictorial renderings of over 90 hospitals, located in diverse areas of the country, and diverse environments, which demonstrate the wide variety of building construction (and surrounding environments) of WMTS licensed hospitals. In order to protect all of these different environments – and these letters and pictures still provide only a small sampling of the over 2300 hospitals in which WMTS systems are deployed -- the Commission's "default" protection distances must be based on appropriately conservative assumptions regarding WMTS operating characteristics and environments, and not Google's so-called (and unsubstantiated) "real world" building. A conservative case will actually

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important" claim is unfounded on multiple levels. First, GE Healthcare chose a hospital in the Washington area with which FCC officials would be familiar, which operated a Channel 37 WMTS system installed by GE Healthcare, and which would be willing to cooperate with the tests. Second thousands of hospitals throughout the country operate in markets without a DTV station transmitting on a channel adjacent to Channel 37. Third, Google undermines its own claim by stating a page later that "Washington, DC . . . [has] full power TV broadcasts on channel 36, 38, or both."[1] Fourth, on a technical basis Google's claim of a generally noisier environment due to a DTV station on an adjacent channel is unsubstantiated. To the contrary, GE Healthcare reports that, in its practical experience, DTV out-of-band emissions are well below the maximum permissible levels.

[2] The Coalition and GE Healthcare are preparing the results of two more tests done at actual hospitals in the Milwaukee area, Froedtert Memorial Hospital and Wheaton Franciscan Hospital. These tests have again shown that at the FCC's currently proposed power levels and distances, interference will occur into the hospital's WMTS system from certain directions.

characterize a very large number of hospitals operating in urban, suburban, ex-urban and rural environments, all of which are entitled to be protected from interference from newly authorized TVWS devices.

The Commission's goal here must not be merely to protect only those systems where the environment will be helpful in limiting a TVWS device's signal into a particular WMTS receiver. To the contrary, the "default" distances established as the prevailing rule must be set to assure that interference is not received into those WMTS systems where the environment will not cause all or any of such signal losses. As discussed below, when appropriately conservative assumptions are utilized, appropriately larger protection distances necessary to protect all WMTS systems from interference are derived. At the same time, where those conservative assumptions do not take into account actual building blockage, the Coalition supports providing the opportunity, for the TWVS device to operate in closer proximity to a particular WMTS system based on the actual operating and building characteristics of that system.

To its credit, the Google Proposal does simplify the calculation of protection distances in two significant respects. First, it eliminates arguments over path loss for purposes of the "default" distances by accepting free space path loss as the starting assumption. Second, the Google Proposal eliminates the need to determine the antenna height above ground for both the TWVS transmitter and WMTS receiving antennae in the initial calculations. These are strong improvements in reaching a consensus for the "default" protection distances.

However, Google has taken an inappropriate approach to calculating the default protection distances based on its other assumptions. For example, citing a GE Healthcare pleading, Google proposes to utilize a receiver sensitivity value of -95 dBm and a receiver bandwidth of 10 kHz. But the WMTS Registration Database already shows that many WMTS systems utilize receivers with higher sensitivity and wider bandwidths. To protect WMTS systems that were purchased from a variety of other manufacturers, the WMTS Coalition believes an appropriately conservative assumption of receiver sensitivity should be -100 dBm with a receiver bandwidth of 12.5 kHz.[3]

Similarly, with nothing but a survey of its own campus buildings as evidence, Google asserts that, because "16 dB loss represents a contextually reasonable, albeit conservative, default assumption for building loss in commercial-grade buildings," the Commission should establish default separation distances that are based on a 16 dB assumed building loss.[4] The WMTS Coalition's attached pictures and a number of the letters already in the record demonstrate that this is simply not appropriate to protect a significant percentage of hospital

[3] In fact, these are the characteristics of the radio that has the highest number of registrations with this information on file in the WMTS Database for the 608-614 MHz band.

[4] Google Proposal at 10. Interestingly, Google has previously endorsed the WINNER+ propagation model that suggests (citing Rudd-03) only 7.2 dB for building loss.

environments. Many (if not most) hospitals have significant glass exteriors, and many newer hospitals are employing windows that can be opened (and will be opened for the benefit of fresh air), which will provide virtually no path loss for signals into a WMTS receiver located in exterior portions of the hospital (be they patient rooms, sanitariums or exterior hallways). Moreover, some hospitals deploy WMTS receivers on patios and in courtyards throughout hospital campuses to facilitate monitoring of patients while they ambulate as part of their therapy (as permitted by the FCC's rules), for which there would be no building loss whatsoever.

Instead of using the Google Proposal for a very high building loss, the Coalition believes that no building loss should be applied when the Commission is determining the "default" protection distances applicable to Channel 37 TVWS operations.[5] While this may provide a level of protection greater than necessary in some cases, an assumption of more propagation loss attributable to building construction would provide an insufficient level of protection for a significant number of WMTS licensees. The measurements taken at Inova Hospital in Alexandria, Virginia, already in the record, and the Froedtert Memorial Hospital and Wheaton Franciscan Hospital in Milwaukee (the results of which will soon be submitted) demonstrate that interference can occur at the distances and power levels proposed by the Commission for unlicensed devices.

The Google Proposal contains other elements of path loss which the Coalition believes are inappropriate in calculating the appropriate protection distances. For example, while acknowledging that it is appropriate to assume simple free-space path loss for purposes of determining the "default" protection distance, Google nevertheless assumes an additional 3 dB of path loss to accommodate ground clutter, antenna polarization and pattern mismatch. Adding any such assumptions will, of course, underestimate the potential for interference where it does not exist, for example, where the offending TVWS device is well above street level with direct line of sight into the hospital's glass exterior (and the WMTS receiver). Moreover, because, ultimately, interference is encountered when the noise floor is increased at an existing WMTS receive site, the Coalition believes that the allowed power at the WMTS antenna should be assumed to be -81.6dBm/6MHz, rather than the figures used in the Google Proposal (-73.6 dBm/6MHz). And to account for antenna gain, any aggregation gain and cable loss, an additional -3dB should be included in the analysis. The Coalition also believes that some level of protection must be added to account for the well-acknowledged inaccuracy (+ / - 300 meters) in the identified location of most WMTS systems.

If the Commission uses these alternative assumptions -- which characterize a significant percentage of WMTS systems that must be protected -- more appropriate, albeit larger, protection distances will be created. The WMTS Coalition has calculated path losses for a

[5] The Milwaukee tests, results of which are being prepared for submission into the record in these proceedings, actually show that in some directions, there was virtually no signal loss by reason of building construction.

variety of building constructions and TVWS power levels, summarized in Table 1. If the FCC assumes 0 dB for building loss, with an additional factor of 300 meters to account for known inaccuracies in the coordinates registered in that database the protection distances, which should be measured from the coordinates in the WMTS database, will range from 3.6 kilometers (at a transmit power level of 40mW) to 33.4 kilometers (at a transmit power level of 4W). Even assuming some building loss, for example 3db (which would place many hospitals at risk where glass windows or outdoor installations provide no such shielding), appropriate protection distances would range from 2.65 km (at 40 mW) to 23.7 km (at 4W). This is the minimum approach that the Commission should take if it is to be true to the guiding principles set forth above.

Using a conservative, but realistic, approach in defining the "default" protection distances is entirely appropriate when the Commission considers the impact of interference on any hospital's WMTS system. As the numerous letters already in the record show, any interference from a TVWS device will have significant adverse impact on the delivery of efficient and effective critical health care. As many of these letters demonstrate, WMTS allows a single nurse to monitor as many as 48 patients simultaneously. If a WMTS system suffers interference from an unlicensed device, the negative results will range from the monitoring nurse's receipt of false indications that a patient is suffering a health-related incident to much worse, the total failure of the monitoring screen. Such incidents of interference will cause the affected healthcare practitioners to go unnecessarily into "alert" mode for the patients being monitored. In all cases, such incidents of interference will reduce the hospital's confidence in the system's reliability, and if it continues for any length of time can adversely impact the course of patient care in the affected hospital units.

These conservative assumptions are essential to assuring, as the Commission has consistently stated, that "unlicensed TVWS operations on Channel 37 [are] authorized in locations that are sufficiently removed from WMTS users and RAS sites *to protect those incumbent users from harmful interference,*"[6] But the Coalition also agrees with the Google Proposal that opportunities should be provided for changing the protection distances calculated using the "default" assumptions by demonstrating that the characteristics of a particular WMTS installation are inconsistent with those assumptions. The Google Proposal, however, turns the FCC's regulatory regime on its head by suggesting that the burden for such a demonstration should be on the WMTS licensee, rather than the TVWS device operator – who occupies the band on an unlicensed basis.[7]

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[6] Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, *Notice of Proposed Rulemaking***,** FCC 14-144, 29 FCC Rcd.12248, at para 100 (2014).

[7] "The FCC could establish a process by which managers of WMTS facilities can request that a particular building be classified as light construction or very light construction, and thus receive additional interference protection where warranted." Google Proposal at 12.

Hospitals have neither the regulatory obligation– as the primary licensee for this band – nor the resources to be compelled to take extraordinary measures to protect themselves from unlicensed operations. If a TVWS device operator wants to use Channel 37 in closer proximity to a hospital than the conservatively calculated protection distances would allow, it should be that unlicensed operator's burden to seek the change. The Coalition does not oppose such an approach, which over time may be automated, to the extent that it would provide appropriate flexibility for increasing unlicensed use of valuable spectrum where doing so will not subject the affected WMTS licensees to harmful interference. But Google has proposed placing the responsibility for such analysis in the wrong hands.

The Coalition would welcome discussions with the Commission and interested proponents of unlicensed uses to develop a mechanism by which an unlicensed device operator could characterize a hospital building construction to show that the assumed propagation losses associated with "free space" conditions and/or no building loss were clearly inappropriate. Some of the relevant information may already be in the WMTS Registration Database. As Google suggests, the Commission could adopt standards for various types of building construction that could be used to recalculate the protection distance that would be allowed for a TVWS device operator located at a particular direction from a WMTS system. As even the attached pictures show, hospitals do not always have the same construction on all sides of its buildings. As such, a TVWS device operator could be allowed to propose to characterize the construction based on the hospital side which it faces for an even greater level of flexibility.

This process could allow the TWVS device operator to work with the affected hospital through the auspices of the WMTS database administrator, and assuming the hospital did not, in good faith, disagree with the characterization, the TWVS database administrator could use the designated characteristics to reduce the protection distance available to the TVWS operator using a chart similar to the one offered in the Google Proposal (but with more classes of "construction" provided to ensure that the wide variety of hospital buildings can be most accurately characterized).

Of course, if interference occurs after a TVWS device is actually operating,[8] the TVWS device would be required to move off Channel 37 immediately. At least, however, there would be an opportunity for TVWS device operators to request tailored protection for a hospital through a straightforward, standard process. But the burden (and cost) for demonstrating that a

[8] No matter how thorough the FCC's rules are in protecting WMTS, the geolocation databases used to facilitate TVWS device operations will also have to be reliable, capable of functioning only in a manner consistent with the FCC's rules, and secure. As the Coalition and GE Healthcare have noted in these proceedings, appropriate protection distances must be accompanied by a process for certifying TVWS devices that requires device proponents to demonstrate compliance with such requirements. *See* GE Healthcare *Ex Parte* Letter in ET Docket No. 14-165 (Mar. 23, 2015) at 2; GE Healthcare Reply Comments in ET Docket No. 14-165 at 9-15 (Feb. 25, 2015).

particular WMTS installation does not warrant the more conservative "default" distance must fall on the unlicensed TVWS device operator, not on the WMTS licensee.

The WMTS Coalition welcomes the opportunity to work with the FCC staff, Google and others in developing a relatively simple mechanism that can be used to reduce the size of appropriately conservative protection distances where "real world" circumstances justify such reduction. Similar bilateral negotiations have been successful in reaching appropriate compromises in a number of recent proceedings, including the MBANs rules and rules governing protection distances in both the AWS-3 and 5 GHz proceedings. Properly motivated by the FCC, all parties should welcome such an opportunity. Such a mechanism can assure that all WMTS licensees receive adequate protection from interference. And in any case, any TVWS device that is suspected of creating interference, at whatever distance it is operating, must be required to immediately mitigate that interference.

Respectfully,

/s/
Lawrence J. Movshin
Timothy J. Cooney

Wilkinson Barker Knauer, LLP
Counsel to the WMTS Coalition

CC: Mr. Julius Knapp
Mr. Ira Keltz
Mr. Hugh Van Tuyl
Ms. Geraldine Matise
Ms. Aspasia Paroutsas

TABLE 1

Parameter	Value	Units	Notes
Frequency	611	MHz	
WMTS Bandwidth	12.5	kHz	
Receive Sensitivity	-100	dBm/12.5 kHz	
I/N	-6	dB	
TVWS Occupied Bandwidth	5.5	MHz	
Bandwidth Conversion	26.4	dB	= 10 * log (5.5 * 1000 / 12.5)
Net antenna gain / aggregation gain / cable loss	3.0	dB	
Allowed Power at WMTS Antenna	**-82.6**	**dBm/6 MHz**	= (-100) + (-6) + 26.4 - 3
Geolocation Inaccuracy Factor	300	meters	

Calculated FSPL Separation Distances (meters)

Assumed Building Penetration Loss (dB)	Tx EIRP (dBm/6 MHz)					
	16	20	24	28	32	36
0	3,609	5,545	8,613	13,474	21,180	33,393
3	2,643	4,013	6,185	9,627	15,082	23,728

EXHIBIT 1

A personal membership group of the
American Hospital Association

155 N. Wacker Drive, Suite 400 | Chicago, IL 60606
ashe.org | ashe@aha.org | 312-422-3800

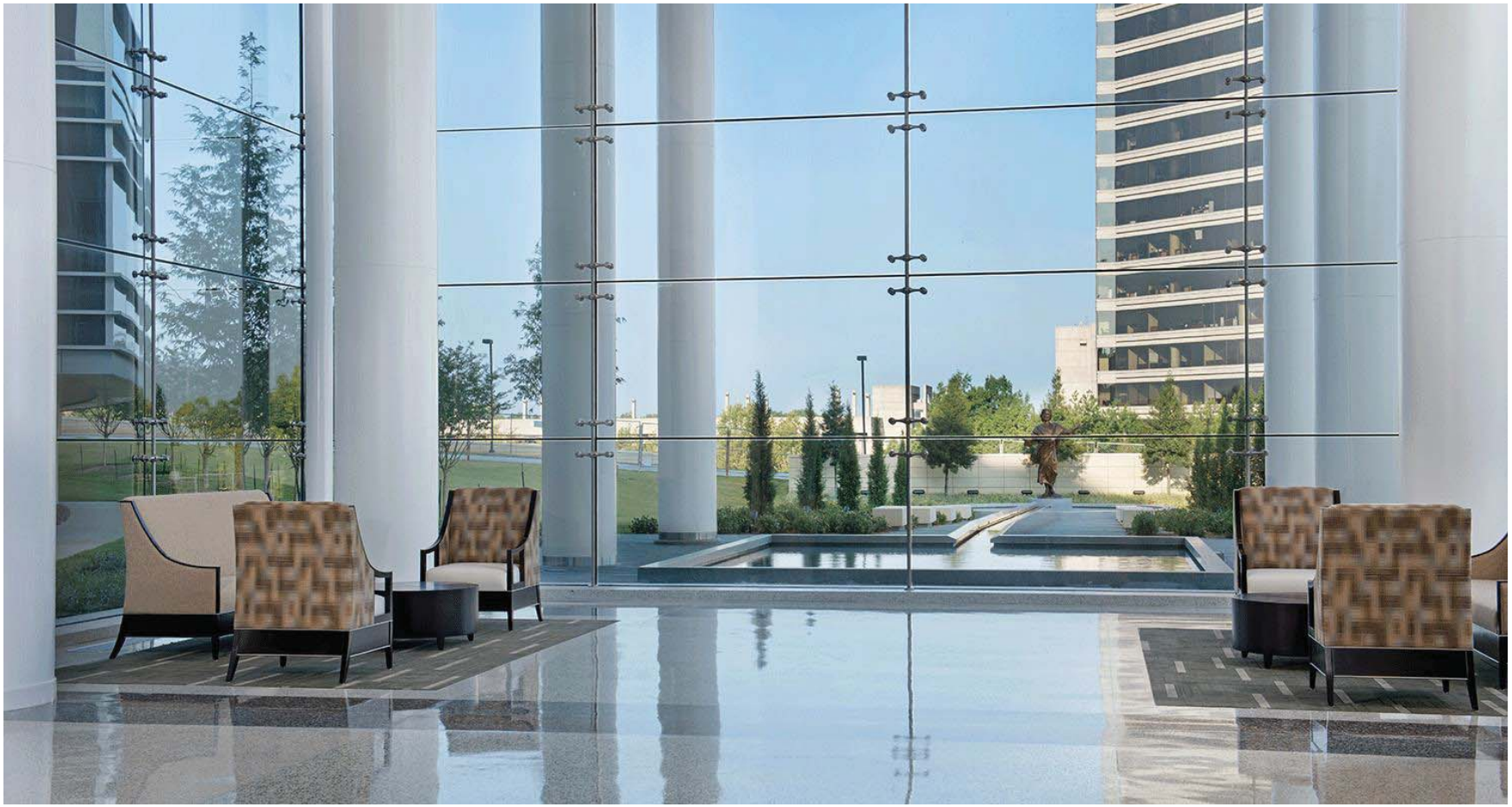
SUNY Upstate Medical University - Cancer Center
Syracuse, NY

Golisano Children's Hospital of Southwest Florida
Ft. Myers, FL

Baylor Scott & White Medical Center Waxahachie
Waxahachie, TX

Saint Francis Health System
Tulsa, OK

Saint Francis Health System
Tulsa, OK



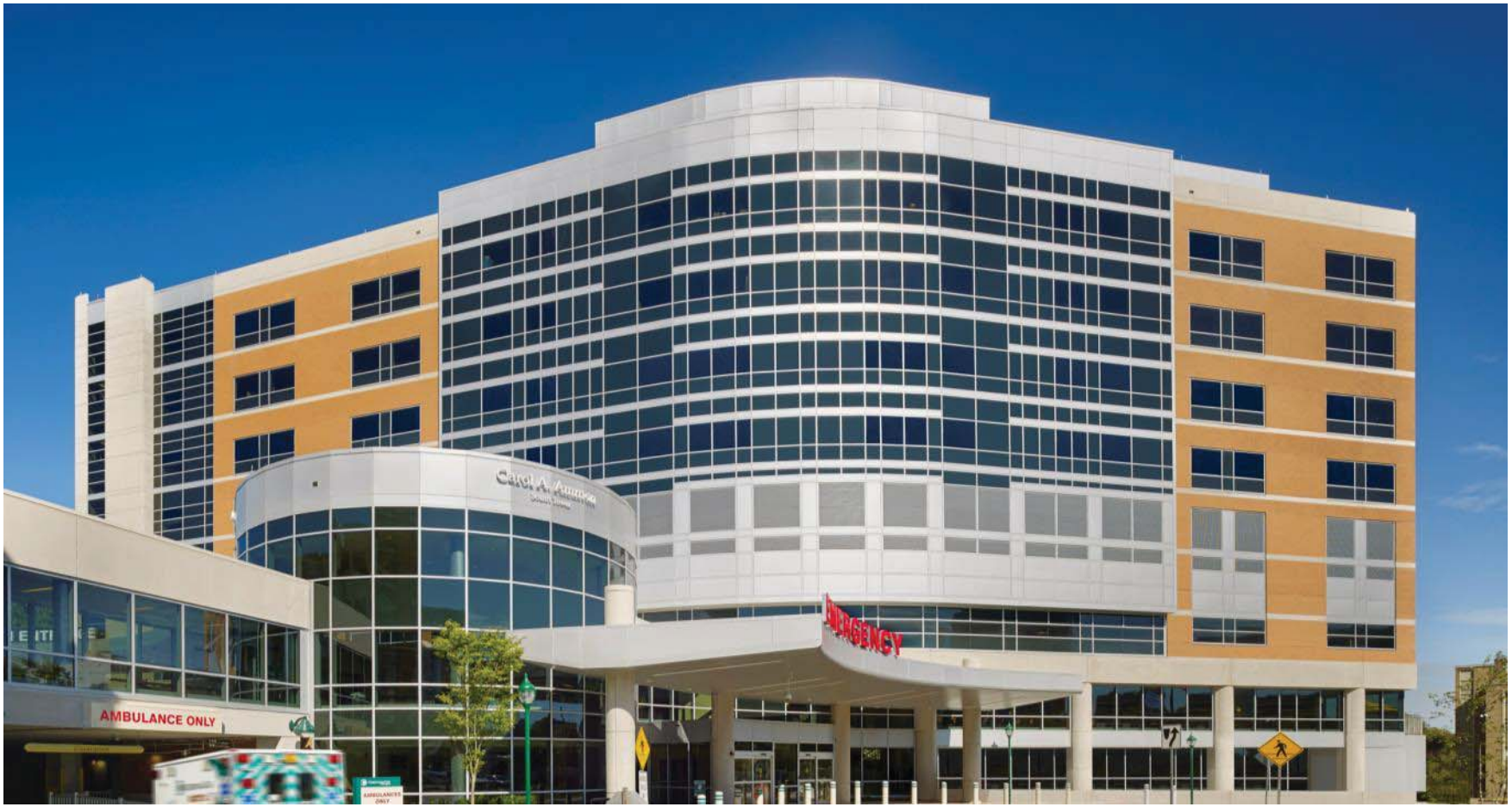
William P. Clements Hospital at UT Southwestern
Dallas, TX

Danbury Hospital, Peter and Carmen Lucia Buck Pavilion
Danbury, CT

Danbury Hospital, Peter and Carmen Lucia Buck Pavilion
Danbury, CT

UCSF Medical Center at Mission Bay
San Francisco, CA

Christiana Care Wilmington Hospital
Wilmington, DE



Christiana Care Wilmington Hospital
Wilmington, DE

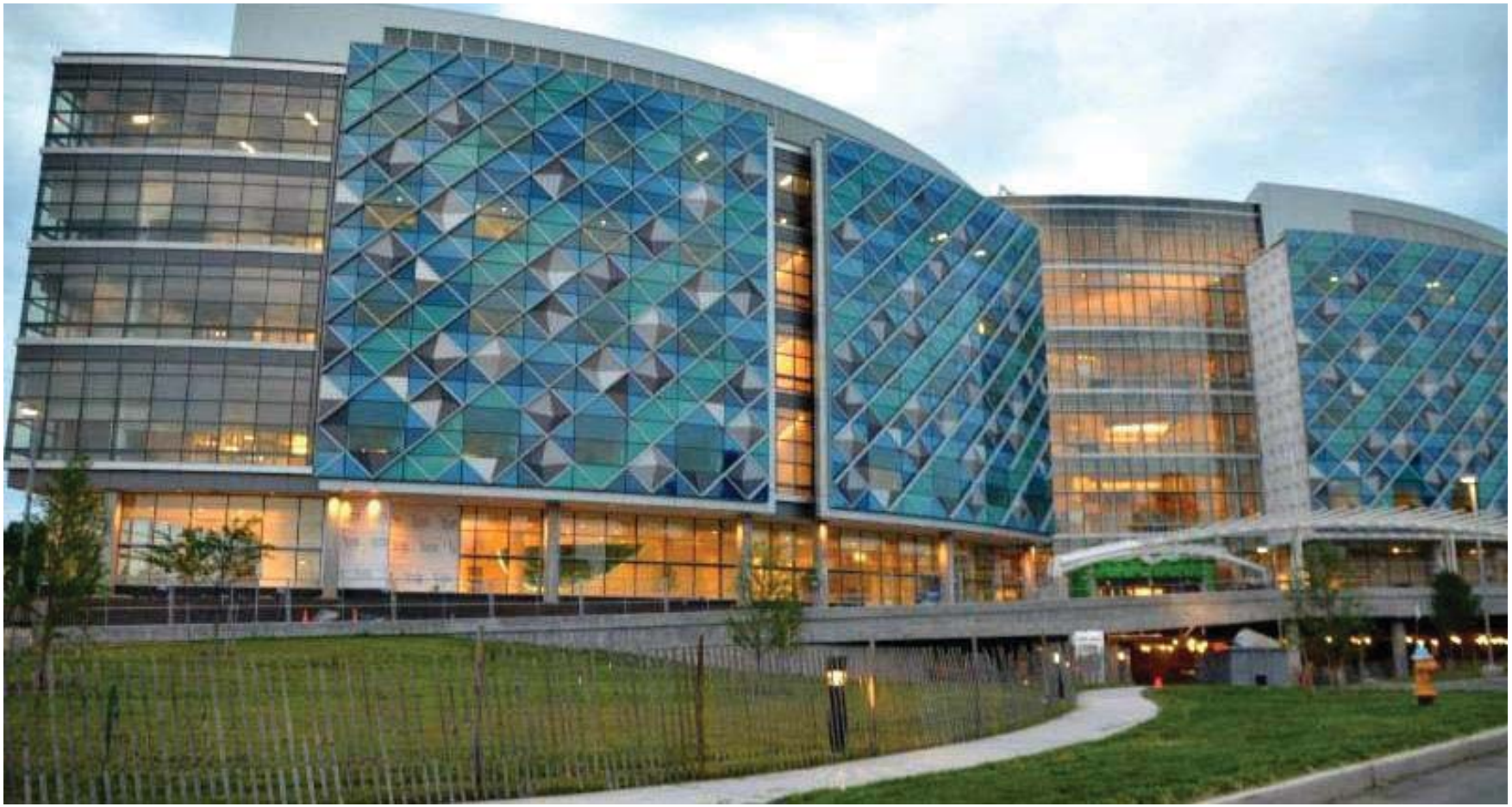
Saint Luke's Hospital
Kansas City, MO

University of Maryland Medical Center
Baltimore, MD

Bayhealth Medical Center
Dover, DE

CHOC Children's Hospital Bill Holmes Tower
Orange, CA

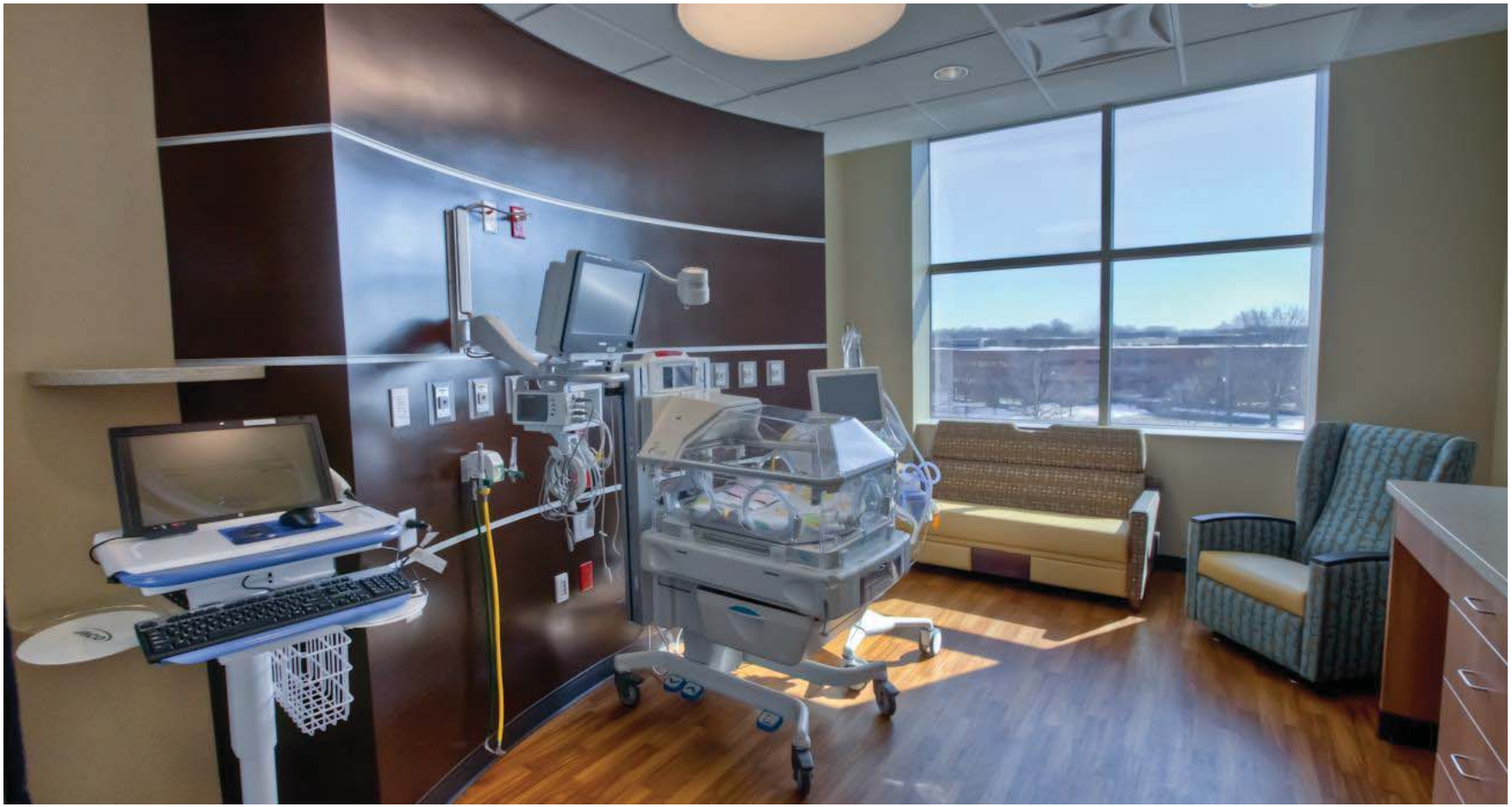
Nemours/Alfred I. duPont Hospital for Children
Wilmington, DE



Sanford Aberdeen Medical Center
Aberdeen, SD

Shawnee Mission Medical Center - Birth Center
Shawnee Mission, KS

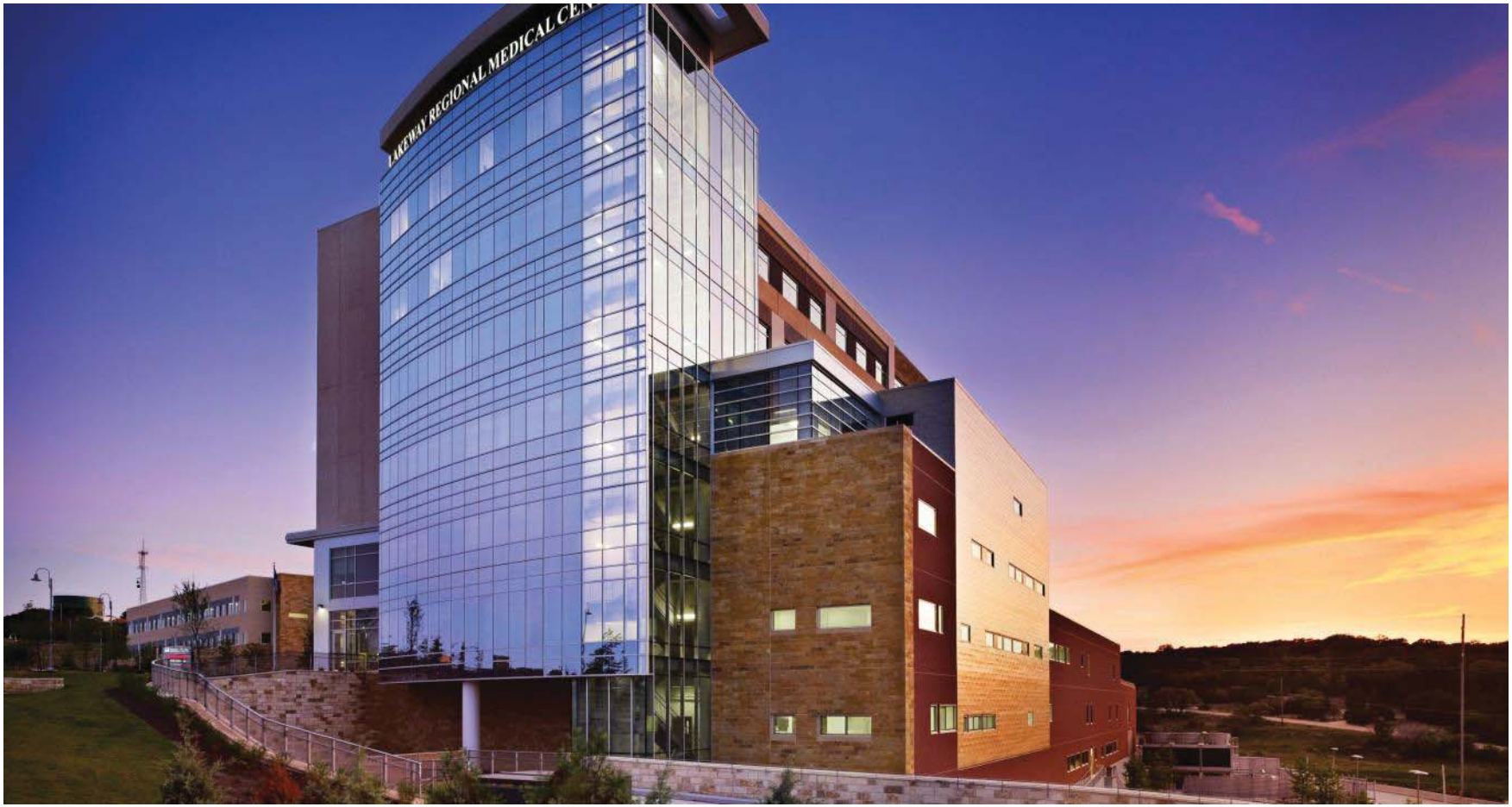
Shawnee Mission Medical Center - Birth Center
Shawnee Mission, KS



Cohen Children's Medical Center
New Hyde Park, NY

Long Island Jewish Medical Center
New Hyde Park, NY

Lakeway Regional Medical Center
Lakeway, TX



Lakeway Regional Medical Center
Lakeway, TX

The University of Texas MD Anderson Cancer Center
Houston, TX

The Louis & Peaches Owen Heart Hospital
Tyler, TX

Christiana Care Wilmington Hospital
Wilmington, DE

Christiana Care Wilmington Hospital
Wilmington, DE

Kaiser Permanente Gaithersburg
Gaithersburg, MD

Kaiser Permanente Gaithersburg
Gaithersburg, MD

Mercy Health - West Hospital
Cincinnati, OH

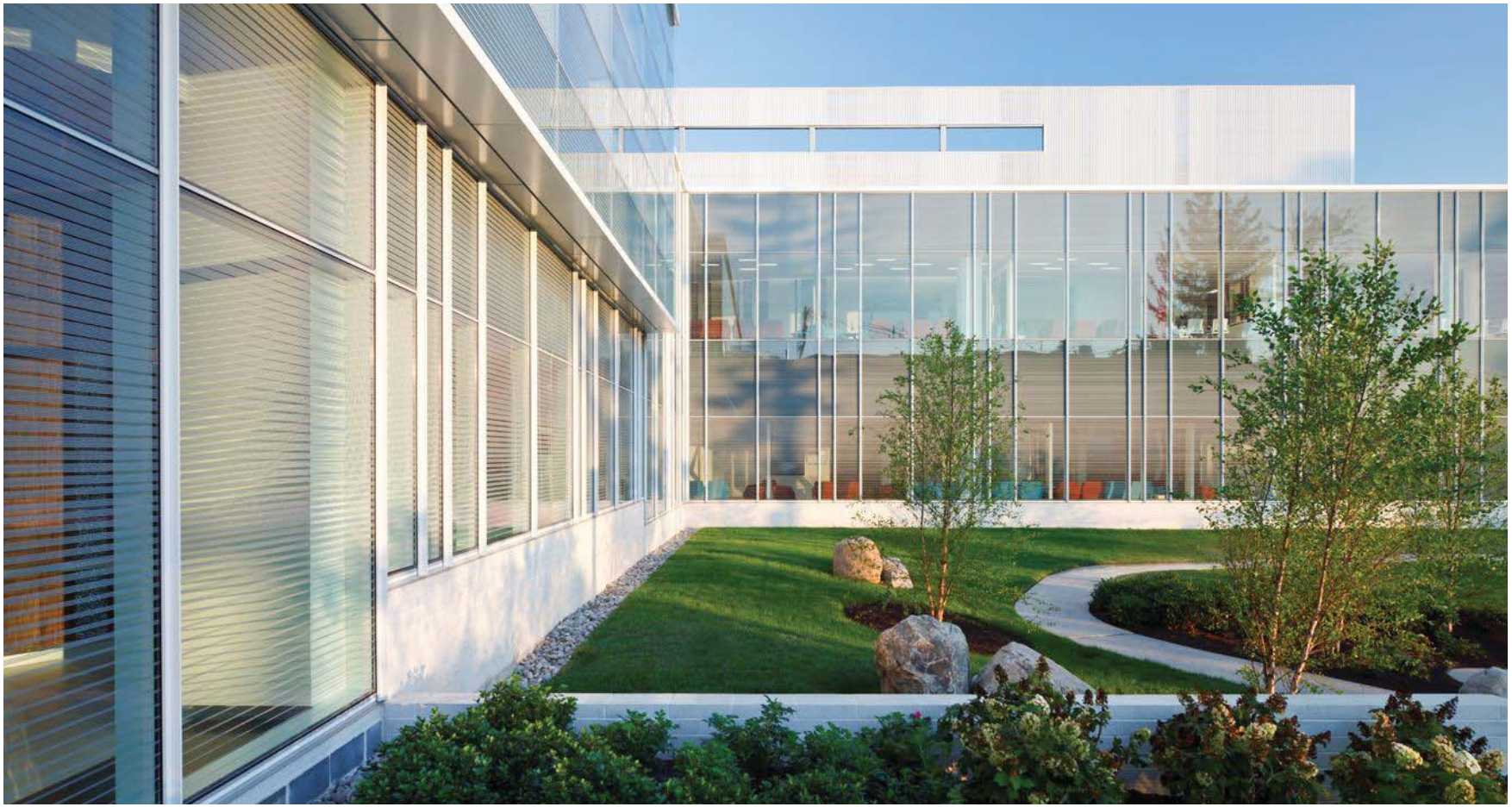
Kaiser Permanente Orange County Medical Center
Anaheim, CA

Kaleida Health Gates Vascular Institute
Buffalo, NY

Barnes-Jewish Center for Outpatient Health
St. Louis, MO

Palomar Medical Center
Escondido, CA

Pocono Medical Center
East Stroudsburg, PA



Penn Medicine Valley Forge
Berwyn, PA

Fort Belvoir Community Hospital
Fort Belvoir, VA

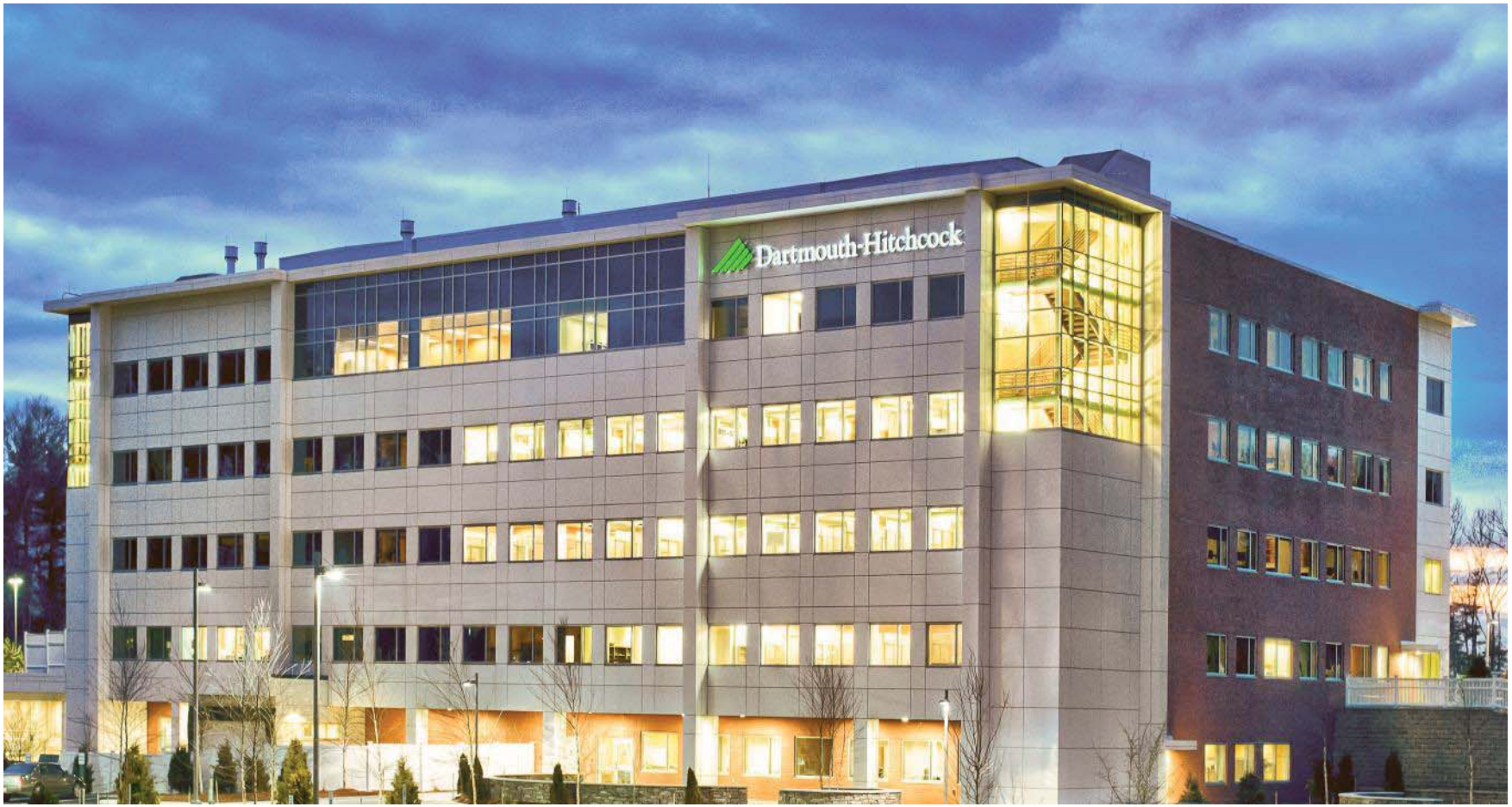
Children's of Alabama Benjamin Russell
Birmingham, AL

Parkview Regional Medical Center
Fort Wayne, IN

Wentworth-Douglas Hospital
Dover, NH

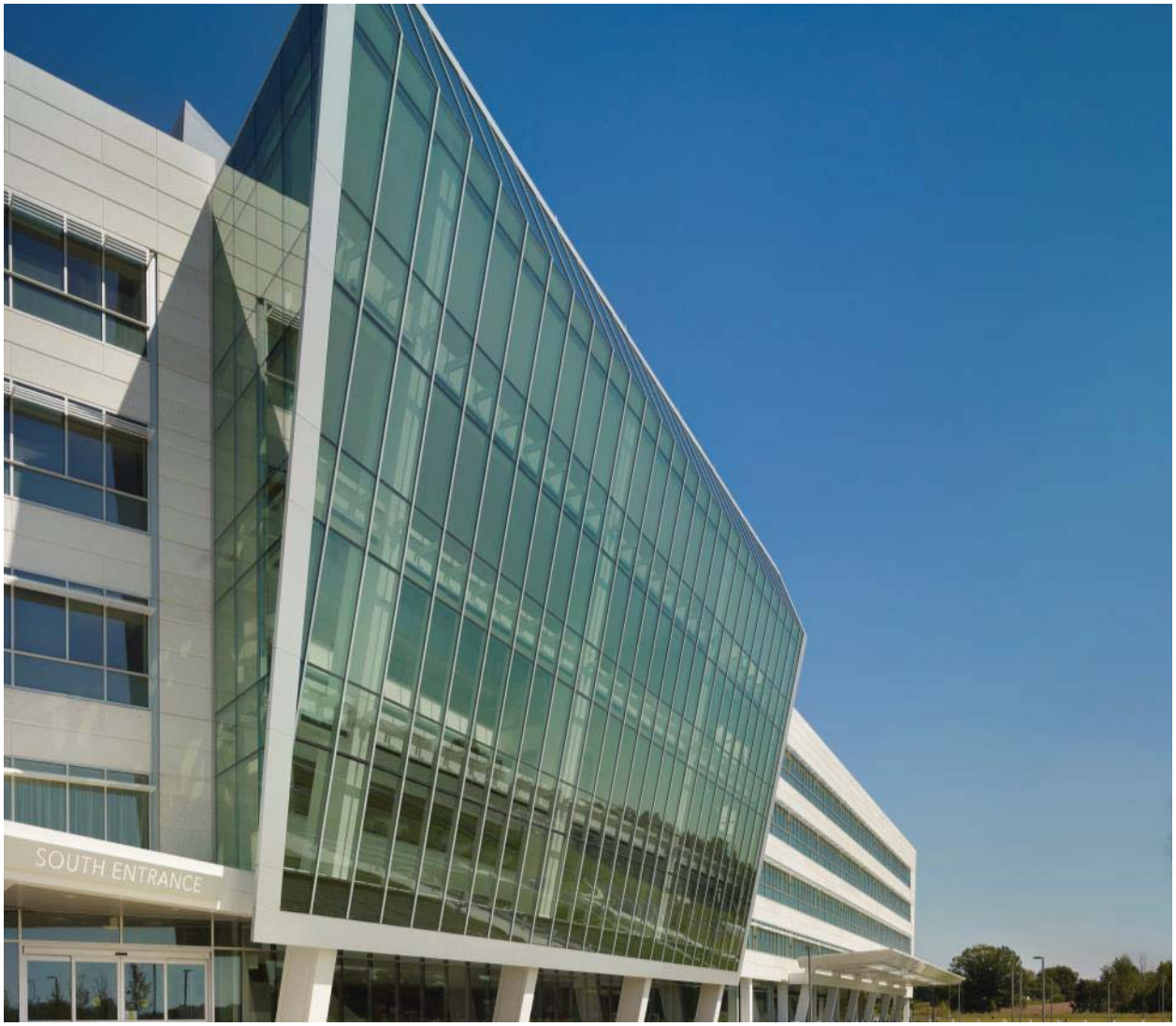
Norton Sound Regional Hospital
Nome, AK

Dartmouth-Hitchcock Nashua
Nashua, NH

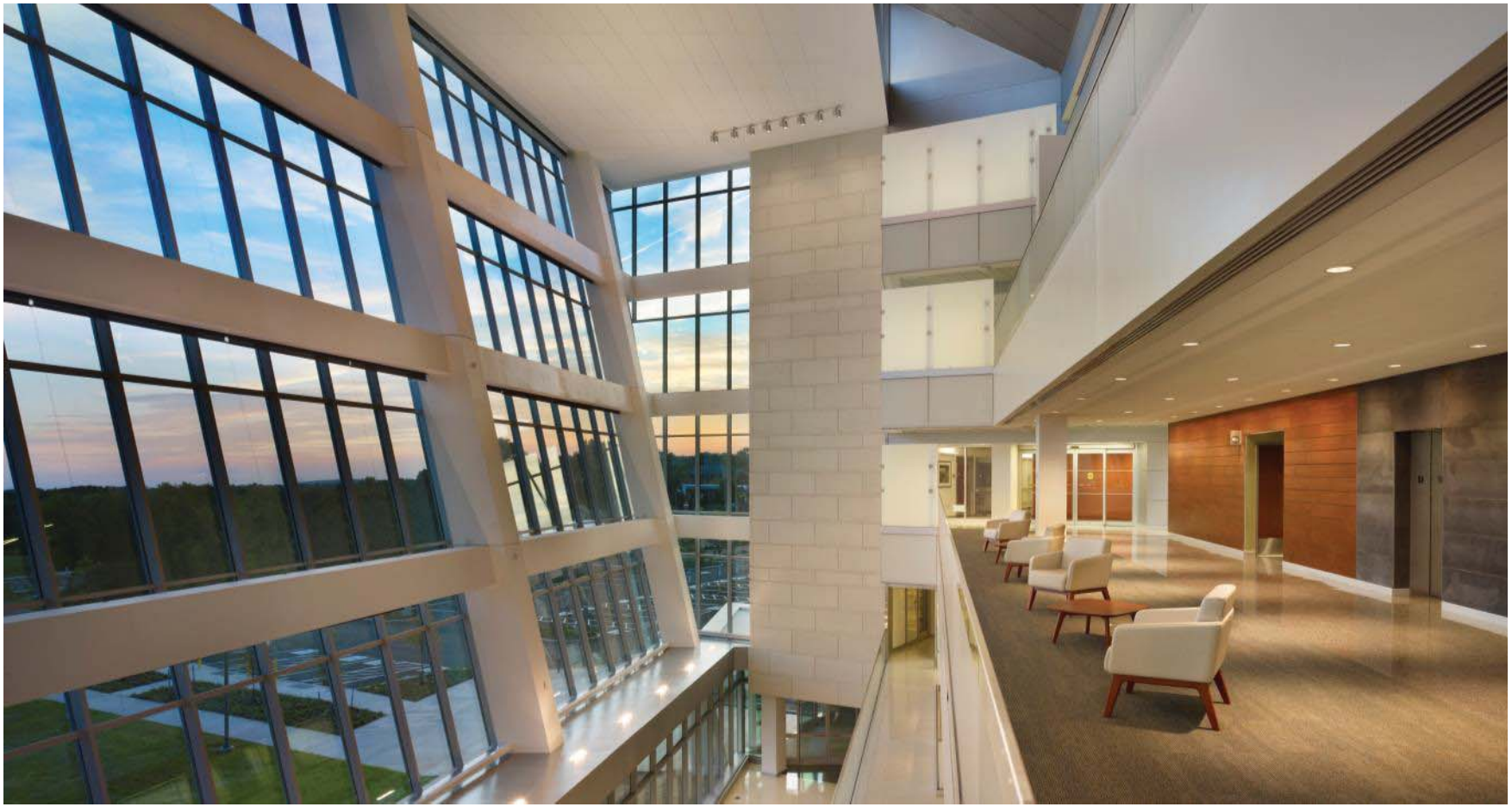


Penn State Hershey Children's Hospital
Hershey, PA

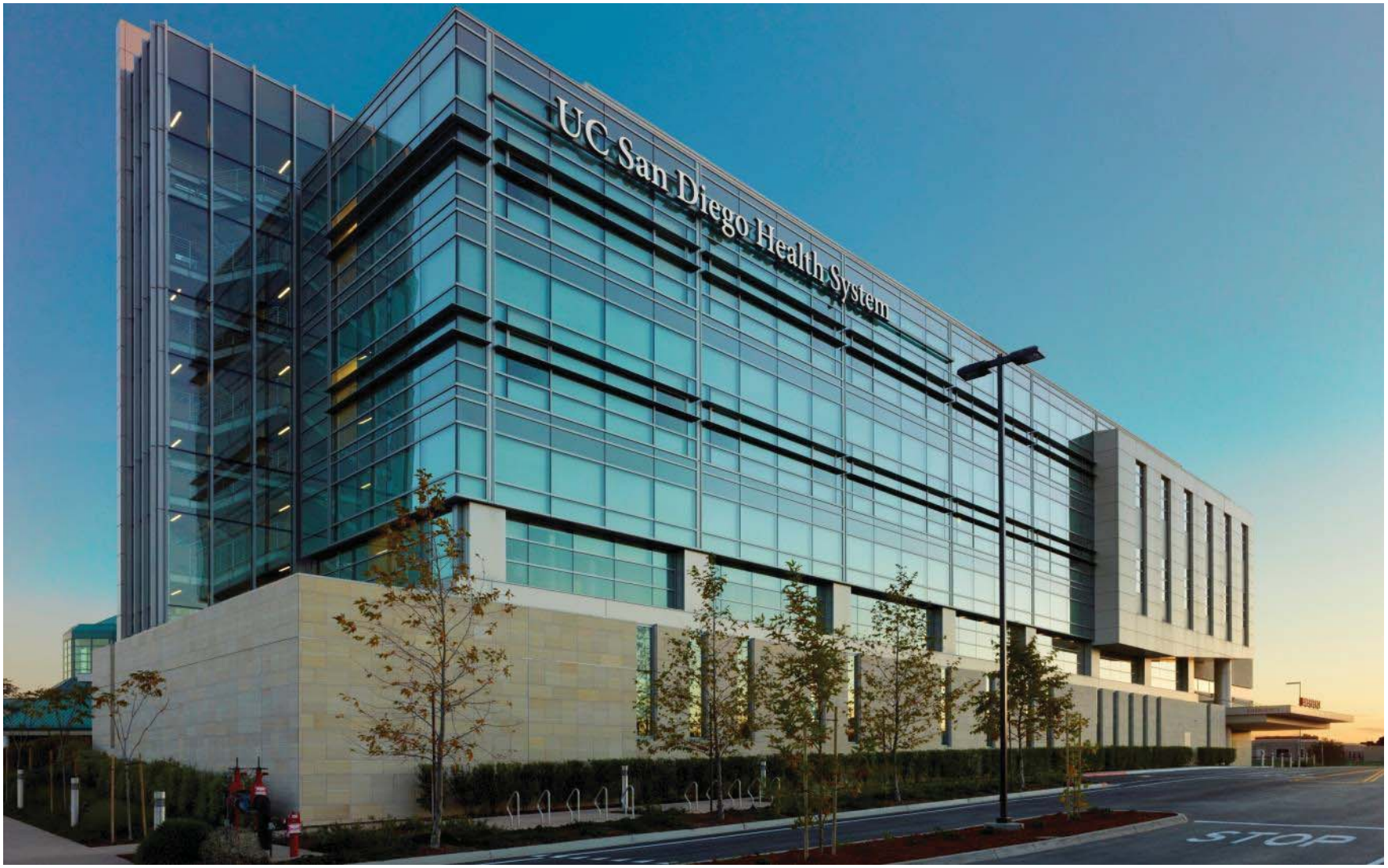
Einstein Medical Center Montgomery
East Norriton, PA



Einstein Medical Center Montgomery
East Norriton, PA



UC San Diego Health System
La Jolla, CA



Ann and Robert H. Lurie Children's Hospital of Chicago
Chicago, IL

Ann and Robert H. Lurie Children's Hospital of Chicago
Chicago, IL

Mary Catherine Bunting Center at Mercy
Baltimore, MD

St. Joseph Regional Medical Center
Paterson, NJ

Virginia Commonwealth University Health System - Critical Care Hospital
Richmond, VA

VA Long Beach Healthcare System
Long Beach, CA

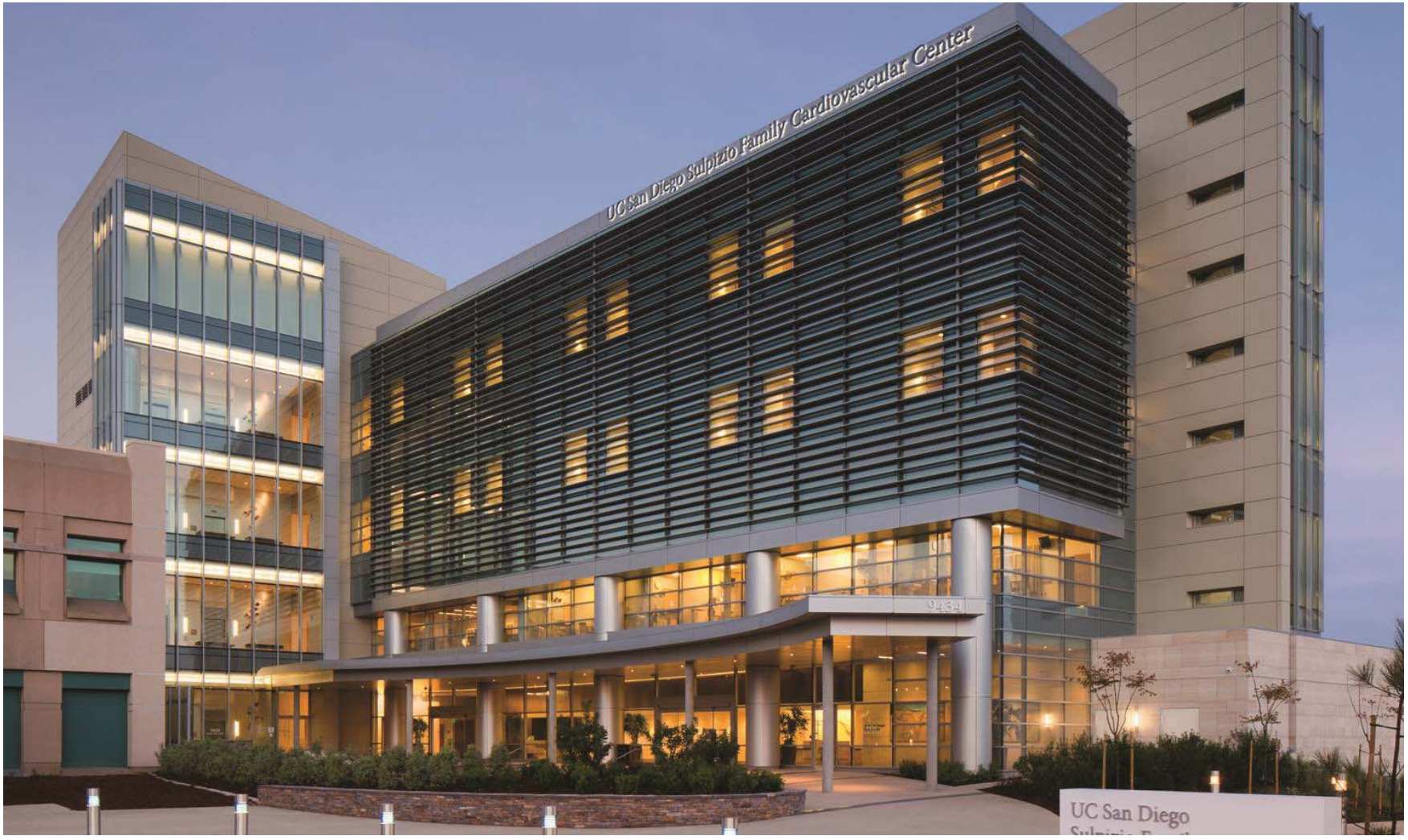
Saint Joseph-London
London, KY

Massachusetts General Hospital's Lunder Building
Boston, MA

Rush University Medical Center Hospital Tower
Chicago, IL

Central Dupage Hospital Patient Care Pavilion
Winfield, IL

San Diego Sulpizio Family Cardiovascular Center
La Jolla, CA



Mills-Peninsula Medical Center
Burlingame, CA

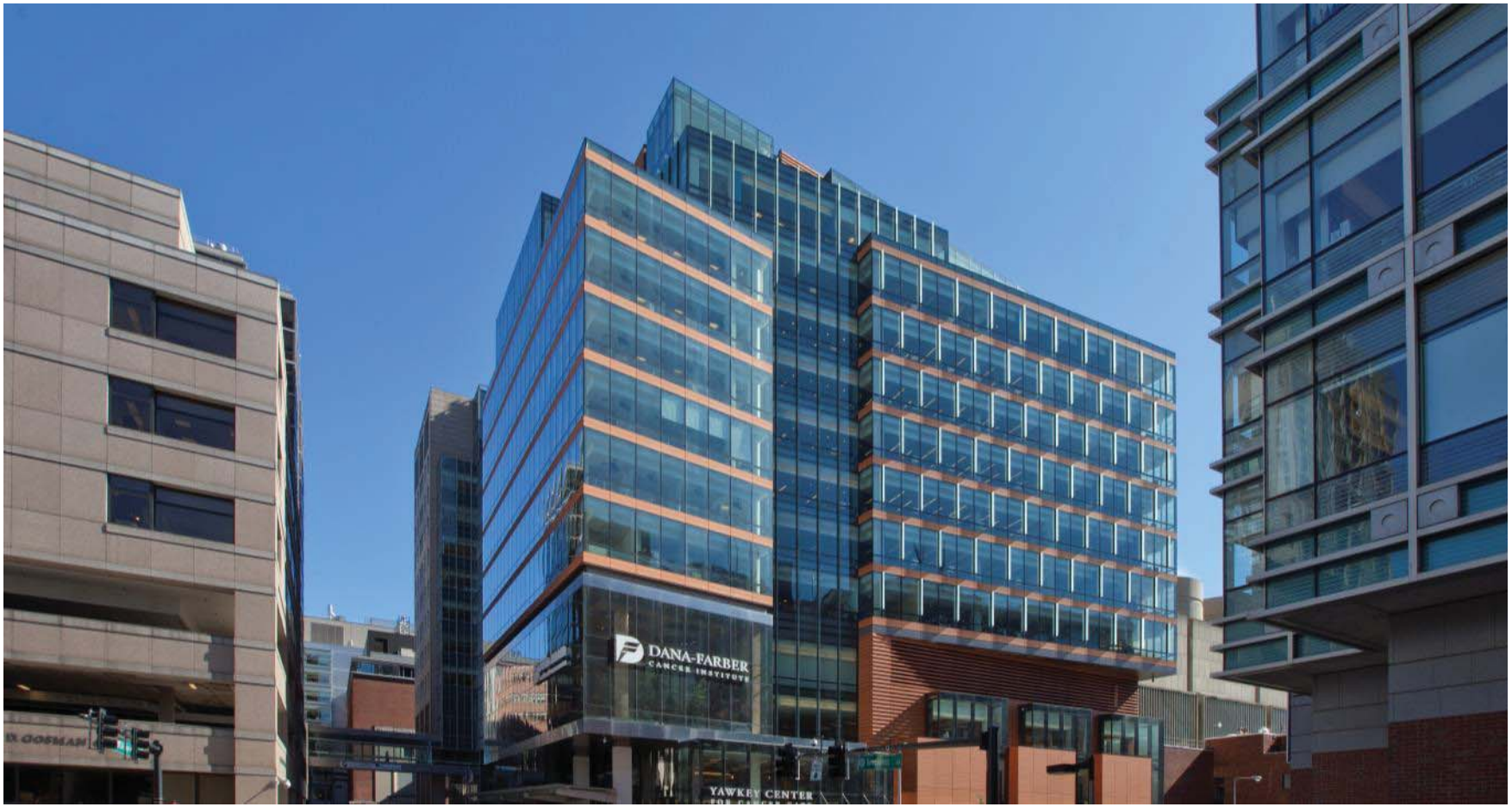
UPMC Passavant
Pittsburgh, PA

University of Minnesota Amplatz Children's Hospital
Minneapolis, MN

Children's Hospital Los Angeles, Marion and John E. Anderson Pavilion
Los Angeles, CA

Children's Hospital Los Angeles, Marion and John E. Anderson Pavilion
Los Angeles, CA

Dana-Farber Cancer Institute, Yawkey Center for Cancer Care
Boston, MA



Dana-Farber Cancer Institute, Yawkey Center for Cancer Care
Boston, MA

University of Virginia, The UVA Emily Couric Clinical Cancer Center
Charlottesville, VA

University of Virginia, The UVA Emily Couric Clinical Cancer Center
Charlottesville, VA

Children's Hospital of Philadelphia
Philadelphia, PA

Advocate Lutheran General Hospital
Park Ridge, IL

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ASHE
A personal membership group of the
American Hospital Association